Claims

1. (Amended) An alternating current type surface-discharge plasma display panel comprising a facing pair of substrates and a plurality of ribs interposed between the substrates so as to form a plurality of spaces,

the plurality of spaces being provided with a phosphor layer and filled with discharge gas, so as to form a plurality of discharge spaces,

inside each of the discharge spaces, plural pairs of display electrodes covered by a dielectric layer being provided,

the plasma display panel performing displaying by the following steps: 1) writing by an accumulation of electric charge in the dielectric layer, 2) applying a predetermined sustaining voltage between the pairs of display electrodes, 3) glow-discharging in selected discharge spaces in which the electric charge has been accumulated in the dielectric layer, and 4) converting ultraviolet light resulting from the glow-discharge into visible light by means of the phosphor layer,

wherein the dielectric layer is made by laminating at least two different dielectric materials,

and wherein a panel structure is set such that an equivalent electric field strength of 37V/cm · Pa or more

is generated in the selected discharge spaces, when the predetermined sustaining voltage is applied.

2. The plasma display panel of Claim 1,

wherein the discharge gas contains xenon, and the ultraviolet light contains more amount of xenon molecular line than an amount of xenon resonance line on the spectrum.

3. (Amended) An alternating current type surface-discharge plasma display panel comprising a facing pair of substrates and a plurality of ribs interposed between the substrates so as to form a plurality of spaces,

the plurality of spaces being provided with a phosphor layer and filled with discharge gas, so as to form a plurality of discharge spaces,

inside each of the discharge spaces, plural pairs of display electrodes covered by a dielectric layer being provided,

the plasma display panel performing displaying by the following steps: 1) writing by an accumulation of electric charge in the dielectric layer, 2) applying a predetermined sustaining voltage between the pairs of display electrodes, 3) glow-discharging in selected discharge spaces in which the electric charge has been accumulated in the dielectric layer, and 4) converting ultraviolet light resulting from the glow-discharge into visible light by means of the phosphor layer,

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wherein an amount of xenon contained in the discharge

gas and filling pressure of the discharge gas, a gap between the display electrodes, and a thickness and a permittivity of the dielectric layer are set so that an equivalent electric field strength of 37V/cm · Pa or more is generated in the selected discharge spaces, when the predetermined sustaining voltage is applied.

4. The plasma display panel of Claim 3,

wherein xenon contained in the discharge gas is in a range of 5% to 90 % inclusive.

5. The plasma display panel of Claim 4,

wherein the filling pressure of the discharge gas is in a range of 66.5KPa to 200KPa inclusive.

6. The plasma display panel of Claim 3,

wherein the thickness of the dielectric layer is in a range of 3 μm to 5 μm inclusive, at a point where a pair of the display electrodes are opposing each other.

7. (Amended) The plasma display panel of Claim 6,

wherein the constant of the dielectric layer is 6 or more and less than 9.

8. (Delete)

9. The plasma display panel of Claim 3, 4, 5, 6, or 7, wherein the distance between the pairs of display electrodes is in a range of 20 μm to 90 μm inclusive, where the display electrodes are facing the discharge spaces.

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10. (Amended)

An alternating current type surface-discharge plasma display panel comprising a first plate and a second plate disposed parallel to each other, with a plurality of ribs interposed between the two plates so as to form a plurality of spaces,

the first plate having, on an inner surface, plural pairs of display electrodes covered by a dielectric layer,

the second plate having, on an inner surface, a plurality of address electrodes,

the first plate and the second plate being disposed in such a manner that the display electrodes cross over the address electrodes,

each of the plurality of ribs being interposed between adjacent address electrodes, and

each of the plurality of spaces being provided with a phosphor layer and filled with discharge gas, so as to

form discharge spaces,

the plasma display panel performing displaying by the following steps: 1) accumulating electric charge in the dielectric layer by performing writing-discharge between the display electrodes and the address electrodes, 2) applying a predetermined sustaining voltage between the pairs of display electrodes, 3) glow-discharging in selected discharge spaces in which the electric charge has been accumulated in the dielectric layer, and 4) converting ultraviolet light resulting from the glow-discharge into visible light by means of the phosphor layer,

wherein a panel structure is set such that an equivalent electric field strength of 37V/cm · Pa or more is generated in the selected discharge spaces, when the predetermined sustaining voltage is applied.

11. (Amended)

An alternating current type surface-discharge plasma display panel comprising a first plate and a second plate disposed parallel to each other, with a plurality of ribs interposed between the two plates so as to form a plurality of spaces,

the first plate having, on an inner surface, plural pairs of display electrodes covered by a dielectric layer,

the second plate having, on an inner surface, a plurality of address electrodes,

the first plate and the second plate being disposed in such a manner that the display electrodes cross over the address electrodes,

each of the plurality of ribs being interposed between adjacent address electrodes, and

each of the plurality of spaces being provided with a phosphor layer and filled with discharge gas, so as to form discharge spaces,

the plasma display panel performing displaying by the following steps: 1) accumulating electric charge in the dielectric layer by performing writing-discharge between the display electrodes and the address electrodes, 2) applying a predetermined sustaining voltage between the pairs of display electrodes, 3) glow-discharging in selected discharge spaces in which the electric charge has been accumulated in the dielectric layer, and 4) converting ultraviolet light resulting from the glow-discharge into visible light by means of the phosphor layer,

wherein an amount of xenon contained in the discharge gas and filling pressure of the discharge gas, a gap between the display electrodes, and a thickness and a permittivity of the dielectric layer are set so that an equivalent electric field strength of 37V/cm · Pa or more is generated in the selected discharge spaces, when the predetermined

sustaining voltage is applied.

12. The plasma display panel of Claim 11,

wherein xenon contained in the discharge gas is in a range of 5% to 90 % inclusive.

13. The plasma display panel of Claim 12,

wherein the filling pressure of the discharge gas is in a range of 66.5KPa to 200KPa inclusive.

14. The plasma display panel of Claim 10,

wherein the thickness of the dielectric layer is in a range of 3μm to 5μm inclusive, at a point where a pair of the display electrodes are opposing each other.

15. (Amended) The plasma display panel of Claim 6,

wherein the constant of the dielectric layer is 6 or more and less than 9.

16. (Delete)

17. (Amended) The plasma display panel of Claim 11, 12, 13, 14,

or 15,

wherein the distance between the pairs of display electrodes is in a range of 20 μm to 90 μm inclusive, where the display electrodes are facing the discharge spaces.

18. The plasma display panel of Claim 11, 12, 13, 14, 15, or 16,

wherein the distance between the pairs of display electrodes is in a range of 20 μm to 90 μm inclusive, where the display electrodes are facing the discharge spaces.

19. The plasma display panel of Claim 17,

wherein forms of a pair of the display electrodes differ from each other.

20. The plasma display panel of Claim 17,

wherein at least one of a pair of the display electrodes has protrusions extending toward the other display electrode.

21. The plasma display panel of Claim 19,

wherein one or more protrusions are provided in each of the discharge spaces.

22. The plasma display panel of Claim 17,

wherein the display electrodes are metal electrodes, and the permittivity of the dielectric layer is 6 or more and 9 or less.

23. The plasma display panel of Claim 21,

wherein the dielectric layer is made by laminating at least two different dielectric materials.

24. The plasma display panel of Claim 17,

wherein the display electrodes are made by stacking bus lines on transparent electrodes, and the dielectric layer is thicker on the bus lines than on the transparent electrodes.

25. The plasma display panel of Claim 23,

wherein the dielectric layer is made of:

a first layer made of a first dielectric material which covers the whole surface of the display electrodes with a thickness in a range of 3 μm to 25 μm inclusive; and

a second layer made of a second dielectric material which only covers parts of the first layer where there are bus lines underneath.

26. (Amended) A display unit comprising the alternating

current type surface-discharge plasma display panel

of Claim 1,2,3 10, or 11, and a driving circuit for applying voltage to every electrode included in the plasma display panel.